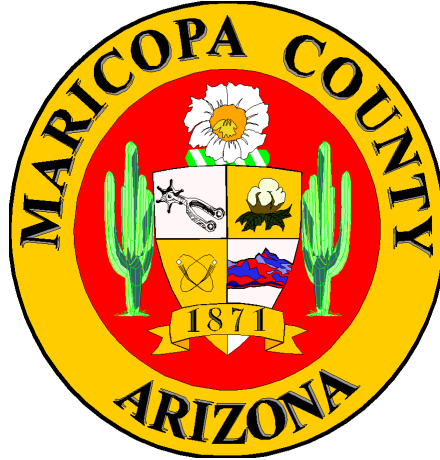


A GUIDE FOR THE PREPARATION OF CONTRACT SPECIFICATIONS



MCDOT ENGINEERING DIVISION APRIL 2000

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I. WHAT ARE THE QUALIFICATIONS FOR WRITING SPECIFICATIONS

- **The success of the project could depend on the specification writer's ability to think through the project clearly.**
- **The writer must be someone who is able to see the entire project; yet visualize the details. Conversely, the writer must be able to focus clearly on the details without losing sight of the project.**
- **The writer must have an analytical mind and the ability to see separate steps,**

interrelationships and sequences.

- **The writer must be able to grasp new ideas and concepts quickly.**
- **The writer must be able to put thoughts into words, without ambiguity or vagueness, and in such a manner that it is easily understood by a wide range of readers.**
- **The writer must be able to anticipate the needs of a number of different users, from lawyers to engineers to laborers, and be able to provide the information required by each, in a clear and orderly fashion. The writer must realize that the information required by the users changes as the contract moves from the bidding stage through construction.**
- **The writer must be able to appreciate the value of exact quantification and precise measurement.**
- **The writer must be familiar with Federal, State, and local standards, codes, policies and procedures that affect materials, testing, inspection, and construction.**
- **The writer must have an open mind, and the temperament to seek out and accept input, including constructive criticism, from others.**
- **The writer must work well under pressure, because they will be expected to create a flawless set of control provisions in an insufficient amount of time. A good sense of order and direction is imperative.**

II. STUFF TO KNOW BEFORE STARTING TO WRITE SPECIALS

- **Each of the 4 C's apply to every Specification**
 - Clear No ambiguity
 - Concise No excess verbiage
 - Complete All required information in the proper format
 - Correct Technically accurate and applies to this project

Use words that are easily understood

- **Study the plans thoroughly. Know what you're writing about**
- **Special Provisions are written to the Contractor not the Engineer. They shall not contain instructions to the Engineer**
- **Say it once; if it's in the plans don't say it at all. A picture may be worth a thousand words, but the wrong words in a Special Provision can make the picture worthless.**
- **Each Special Provision must be project specific. Combine and tailor MCDOT "standard canned" provisions and GSP's to apply specifically to the project**
- **If the information is in the MAG Specifications or the MCDOT Supplement to MAG it does not belong in the Special Provisions. Saying it twice does not make it more enforceable, and often leads to confusion.**
- **Each Special Provision is to supplement or revise the MAG Specifications or MCDOT Supplement to MAG. The writer should not be rewriting the MAG Specification or the MCDOT Supplement to MAG. If the Special Provisions does not reference being in addition**

to the MAG Specification or MCDOT Supplement to MAG, it replaces it.

● **Special Provision must provide definitive direction, procedures and product requirements necessary for completing the work identified. After award, no additional duties or restrictions can be placed on the Contractor without a contract revision.**

● **If there are two reasonable interpretations, the courts generally follow the rule that language is interpreted against the interests of the party who wrote it. The determination is made on the words as written, not on what the writer intended to say. Remember the term.....Reasonable Interpretation**

● **Definitions of Frequently used terms and phrases**

MAG- Maricopa Association of Governments Uniform Standard Specifications and Details MCDOT Supplement- Maricopa County Department of Transportation Supplement to the MAG Special Provisions(S.P.)- A special provision is a specification written for the purpose of describing a unique work function or activity for a particular construction project. The special provisions are made up of selected and appropriate General Special provisions (GSP) and/or the project specific provisions. GSP- General Special Provisions(GSP) are provisions that have been written to cover legal or construction requirements that may occur on a project. This section is often is referred to as boiler plate. The specification writer can modify a GSP or any part of the GSP to match specific needs often referred to as Boiler Plate or any part of the GSP. The outcome is a special provision for the project. Addenda- Addenda are revisions to the plans and contract provisions that are made during the advertising period. Bid Schedule (also called Summary of Quantities)- Provides a complete tabulation of all bid items and pay quantities for the project.

● **Order of Precedence**

The elements of a contract have a well defined ranking. This rank or order of precedence is as follows: Addenda (Highest to Lowest) Special Provisions Project Plans MCDOT Supplement to MAG Uniform Standard Specifications MAG Uniform Standard Specifications Standard drawings or Standard Details It is important that knowledge of the order of precedence be observed not only in writing the specifications but in resolution of conflicts that may surface during administration of the contract.

● **Creating Special Provisions**

Since the need and use of special provisions are important in creation of a contract document (rank of 2nd in order precedence), this subject needs a more detailed description. A special provision is needed when the contract requires a unique or unusual type of work that is not described in the MAG or the MCDOT Supplement to MAG or when an item in the MAG or Supplement must be amended or supplemented. Once a determination that a special provision is needed, the writer should open the GSP file and try to locate a previously written specification that exactly or neatly describes the work/function needed for this project. The GSP file (a collection of special Provisions) can be utilized with little or no changes, then the writer should create the special provision from the GSP file. Should the situation exist that the GSP can not be utilized, the writer authors a unique special provision for the particular project at hand. (NOTE: the newly created special provision should be transferred to

the GSP file at or near time of bidding. This allows other specification writers to use that particular specification without needing to author a complete specification for any future project.

II. WHAT IS THE PROPER FORMAT

The following is a good format for writing Specials Provisions which includes only the necessary information to complete the work:

- **Description**
- **Materials**
- **Construction Requirements**
- **Measurement**
- **Payment**

These same 5 categories apply to every Special Provision you write. In most instances, the writer only has to revise or supplement the information in the appropriate category in the appropriate section of the MAG Specifications or MCDOT Supplement to MAG. If the information does not fit into one of the 5 categories it most likely does not belong in the specifications. The following briefly outlines the requirements for each of the 5 categories:

- **Description**
- **Not required if the work falls under an existing section in the MAG Specification or MCDOT Supplement to MAG**
- **The description of work will always begin with
... "This work shall consist of"; followed by a brief description of what the work is**
- **Use phrases like "furnishing and installing" and "removing and disposing of"**
- **Do not get into specifics**
- **Do not give quantities**
- **Do not say ... "as detailed in the Plans" ... "at the locations shown in the Plans..." or
... "as directed by the Engineer" ...**
- **Materials**
- **Reference material specifications in the MAG Specifications or MCDOT Supplement to MAG whenever possible.**
- **Reference applicable nationally recognized material specifications.**

ANSI- American National Standard Institute

ASTM- American Society for Testing and Materials

AASHTO- American Association of State Highway and Transportation Officials

- **Modify or edit reference specification to meet project needs.**
 - **Establish detailed specification of the properties of each material and the methods of testing when reference specifications are not available.**
 - **Construction Requirements**
 - **Specify the requirements in the order in which they will be performed to reduce the possibility of overlooking a requirement.**
 - **The requirement must be measurable, so it can be determined if the work has been done and done correctly.**
 - **Describe "how to build it" or "end product", but not both.**
 - **Specify testing requirements for acceptance; include any preliminary, interim, and final test requirements.**
 - **If the Contracting Agency has some approval responsibilities spell out when they occur and how they may affect the remainder of the work.**
 - **Say it once.**
 - **Use the MAG Specification or MCDOT Supplement to MAG sections as a guide for additional section breakouts.**
 - **There is no reason to explain or justify to the Contracting Agency personnel.**
 - **"Approval actions" and "acceptance may be considered to be the same when conflict resolution reaches the claim stage. Disclaimers have not been generally successful as a defense in litigation**
 - **If the specifier is not familiar with a particular material or construction practice, capitalize from someone with the required knowledge or experience. Do not guess or speculate.**
 - **Measurement**
 - **Measurement of (what the item is – not the item name) will be by the (unit of measure) for (of) (how measured) Measurement of pavement markers will by the unit for each of 100 installed.**
 - **If the unit of measure is difficult to define, the need for measurement should be questioned.**
- Consider "including" the work with an associated item of work Consider paying by Lump Sum. Consider doing this work by force account.**
- **If the unit of measure is per each or lump sum a measurement statement is not necessary.**
- **Payment**

- ☐ Payment will be made in accordance with Section 109, for the following bid items:
- ☐ "Exact Item Name", per unit of measure.
- ☐ The "Exact Item Name" is to be included and appear exactly as it will appear on the Summary of quantities.
- ☐ Work is never "incidental to" and "payment included in" an item of work.
- ☐ All work should have been described in the text of the Specification and would not normally have to be explained further in the pay statement.

There should be no surprises in the pay statement.

IV. SENTENCE STRUCTURE AND OTHER THINGS GRAMMATICAL

Because specifications must be read and understood by a wide range of people in a variety of professions, it is imperative that they be easy to read and easy to understand. To accomplish this, always:

- Use the simplest words that accurately convey the thought
- Keep sentences short (17 to 20 words)
- Keep the paragraphs short (3 to 4 sentences)
- Write it the way you would say it.

Write in the positive form.

- Instructions should tell the Contractor what to do, not what not to do. ("Shift traffic to the new roadway during daylight hours: is a positive statement.) "Do not shift traffic to the new roadway during hours of darkness" is a negative statement.
- The Contractor "shall" do things; things won't be done "by the Contractor".

As it is normally written: All bolts shall be countersunk, by the Contractor.

As it should be written: All bolts shall be countersunk. The Contractor shall countersink all bolts.

As it is normally written: Two coats of epoxy paint shall be applied, by the Contractor, to all exposed surfaces.

As it should be written: Two coats of epoxy paint shall be applied to all exposed surfaces. The Contractor shall apply two coats of epoxy paint to all exposed surfaces.

IV. PROBLEM AREAS

- Any/All

"any" is a limited number selected by the reader.

"all" is the entire quantity or amount

"repair any cracks" is not completely defined.

"repair all cracks" is completely defined

"repair all cracks greater than 1/8 inch width" is completely defined with a qualifier

- **Amount/Quantity**

Use "amount" when talking about money Use "quantity" when referring to volume, yardage, etc.

- **and/or**

Do not use "and/or"

"And/or" indicates that either "and" or "or" can be used to connect words or phrases. This is seldom the case in a specification.

A power broom and/or power blower shall be used to clean the roadway.

A power broom, a power blower, or both, shall be used to clean the roadway.

Catch basins and/or manholes shall be adjusted to final grade prior to paving.

Catch basins and manholes shall be adjusted to final grade.

- **Included in / Incidental to**

Use "included in", not "incidental to", in most situations.

You should never use...."incidental to and included in"...

"Included in" indicates that it is a part of the item (payment will be made).

"Incidental to" indicates that it is minor work or material related to the item (no payment will be made)

- **Due to the Contractor's Negligence / Due to the Contractor's Operation**

Use "due to the Contractor's operation" in all cases.

Negligence is difficult to prove. Besides, it doesn't really matter whether it was broken due to negligence or not – if the Contractor broke it, the Contractor fixes it.

- **Either – Each**

"Either" usually means "one or the other", but can mean "one and the other"

Avoid the use of "either" because of this double meaning!

"Construct a shoulder on "either" side of the roadway" may get only one shoulder constructed on both sides, without an argument.

- **Noon and Midnight**

Using 12:00 a.m. and 12:00 p.m. can cause confusion, but everyone knows the difference between noon and midnight.

- ☐ **Do not drop the word..."the" For brevity.**

After (the) rough grading is completed, scarify or plow (the) area of (the) old roadbed.

Words and Phrases to be used

- ☐ **"shall" for things to be done by the Contractor.**
- ☐ **"will" for things to be done by the Contracting Agency**
- ☐ **supplement**
- ☐ **revise**

Words and Phrases that will not be used

- ☐ **Should**
- ☐ **Incidental to**
- ☐ **And/or**
- ☐ **Must**

Words and phrases that cannot be measured

- ☐ **Clean**
- ☐ **Smooth**
- ☐ **Properly fitted or assembled**
- ☐ **Good working order**
- ☐ **Neatly finished**
- ☐ **Of an approved type**
- ☐ **Suitably housed**
- ☐ **When or where required**

One word to use with extreme caution

☐ Delete

When making references to Divisions and Sections of the MAG Specifications or MCDOT Supplement to MAG use extreme caution when using the word "delete". Once you have deleted something from the Specifications Book, it is gone. It is gone for the duration of the Project. You must remember the precedence of things. Your Project Specific Special Provisions have a higher priority than the Project Plans or the Specification Book.

VI. STUFF TO REMEMBER

- Start the Special Provision writing process as soon as possible.

Write outline style notes as the design work progress

Have individuals responsible for specific areas provide the information

Use a preprinted sheet with the 5 categories for notes.

- Have someone not directly associated with the project read the Special Provisions and describe the work, and measurement and payment being proposed as they see it after reading the Special.

Listen to the comments and make adjustments.

If this reader had a problem understanding, it is likely that someone else will also, no matter how well you think the Special is written. It is much cheaper and easier to go over the information and revise it before the contract than it is for a claim.

- Be inquisitive, observant, and receptive to comments.
- Be consistent in the wording used.
- If the subject is something that cannot be measured, or it is not measured against a standard, the use of adjectives and other word modifiers will not change the meaning.

There is no difference between "thorough consolidation" and consolidation" of fresh concrete. The determination to be made by the inspector would be whether or not the fresh concrete has been consolidated.

- Requirements are to be definitive and measurable
Requirements that involve "the Engineer's opinion" or work done "to the satisfaction of the Engineer" cannot be realistically bid since the quality requirements are not defined. If the bidder has to guess what will be required the cost will reflect it.
- Setup a system for receiving feedback on problems created by the Special Provisions.